

## Text Searchable File

3/24/99

DP BARCODE: D254478

CASE: 291638  
SUBMISSION: S558560DATA PACKAGE RECORD  
BEAN SHEETDATE: 03/23/99  
Page 1 of 1

## \* \* \* CASE/SUBMISSION INFORMATION \* \* \*

CASE TYPE: EMERGENCY EXEMP ACTION: 510 SEC18-OC F/F USE  
RANKING : 0 POINTS ()  
CHEMICALS: 128834 Pyridate

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ID#: 99MT0012

COMPANY:

PRODUCT MANAGER: 05 ROBERT FORREST 703-308-9376 ROOM: CM2 248  
PM TEAM REVIEWER: BARBARA MADDEN 703-305-6463 ROOM: CM2 278  
RECEIVED DATE: 03/17/99 DUE OUT DATE: 05/06/99

## \* \* \* DATA PACKAGE INFORMATION \* \* \*

DP BARCODE: 254478 EXPEDITE: N DATE SENT: 03/23/99 DATE RET.: / /  
CHEMICAL: 128834 Pyridate  
DP TYPE: 001

	CSF: N	LABEL: Y	
ASSIGNED TO	DATE IN	DATE OUT	ADMIN DUE DATE: 04/12/99
DIV : EFED	03/24/99	4/16/99	NEGOT DATE: / /
BRAN: ERB2	03/24/99	/ /	PROJ DATE: / /
SECT: 01	03/24/99	/ /	
REVR :	03/24/99	/ /	
CONTR:	/ /	/ /	

## \* \* \* DATA REVIEW INSTRUCTIONS \* \* \*

Please review attached specific emergency exemption request from Montana for use of pyridate on mint to control kochia and redroot pigweed. Indicate whether there are concerns for non-target organisms, including endangered/threatened species. Please also discuss the fate characteristics of pyridate and whether EFED has concerns for groundwater contamination.

This is the 1st time this use has been requested under section 18.

Let me know if you need any additional information.

Thank you  
Barbara Madden  
305-6463

## \* \* \* DATA PACKAGE EVALUATION \* \* \*

No evaluation is written for this data package

## \* \* \* ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION \* \* \*

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL
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2050402



Office of Prevention, Pesticides,  
and Toxic Substances

Section 18 Review  
Use of Pyridate (PC # 128834) on mint in Montana  
Environmental Fate and Effects Division  
Bar Code: D254478

**I. Summary:**

The level of concern for acute risk of pyridate is not expected to be exceeded for birds and mammals (including endangered species). The level of concern has been exceeded for chronic risk to mammals (See sec. VI for endangered species). Because of the low exceedance of the level of concern, EFED believes that there is minimal risk to mammals (including endangered species) in Oregon for the proposed use. Freshwater, marine, and estuarine fish and invertebrates (including endangered species) are not expected to be affected by the proposed use. Since, there are no plant toxicity data available, no plant risk assessment can be done. Therefore, EFED assumes that terrestrial and aquatic non-target plants (including endangered species) will be adversely affected from the labeled use of pyridate. There is a concern for the endangered plant species, Water Howellia, in Lake county. Measures must be taken to ensure the protection of this species from pyridate exposure by contacting Montana state endangered species program and/or the U.S. Fish and Wildlife Service.

The proposed use is not expected to pose significant risk to surface and ground water resources. For surface water, the maximum expected concentrations are 97  $\mu\text{g/L}$  for acute risk calculations and 75  $\mu\text{g/L}$  for chronic risk and cancer risk calculations. Concentrations in ground water are not expected to exceed 4.44  $\mu\text{g/L}$ . Modifications of label statements are not recommended.

**II. Background**

Montana Department of Agriculture is requesting an Emergency Exemption for the use of pyridate to control kochia and redroot pigweed in mint. This exemption is for the use of Tough 5.0 EC herbicide<sup>®</sup> (Registration # 100-877), a containing 55.8% of active ingredient of pyridate. This exemption would allow use during May 1 through December 31, 1999 in the counties of Flathead, Lake, Sanders, and Ravalli Counties. A total of 3,600 acres may be treated.

Application Rate: 0.9375  
No. of Applications: 2  
Application Method: Ground

For general use, the maximum application rate for pyridate on any crop is 0.9375 lb. ai/A for mint.

### **III. Environmental Fate Summary**

Pyridate hydrolyzes rapidly with half lives of 66.7, 17.8, and 6.8 hours at pH 5, 7, and 9, respectively. The degradate, CL-9673, appears to be stable to hydrolysis with a reported half life of >35 days (>95% remained as CL-9673 after 35 days) (See Attached memo: Section 18 Emergency Exemption - Use of Pyridate on Garbanzo Beans (Chickpeas) in Washington State to Control Broadleaf Weeds: D244668, PC Code# 128834, ID # 98WA0031).

Pyridate does not undergo any significant aqueous or soil photolysis, but is rapidly hydrolyzed to CL-9673, which is in turn readily photolyzed in water with a half life of 3.7 to 14 days and on soil with a half life of 16 days. These half lives indicate that pyridate and its primary degradate will be short lived in the environment when exposed to sunlight. CL-9673 has terrestrial field dissipation half lives of 7-29 days.

In anaerobic conditions, the degradate is persistent with a half life for anaerobic soil metabolism of 330-630 days. The soil partition coefficient ( $K_d$ ) for CL-9673 is 0.3-3.5, indicating it is not sorbed.

Neither pyridate nor CL-9673 is volatile, with a vapor pressure for pyridate of  $7.49 \times 10^{-9}$ , and a Henry's Constant of  $2.49 \times 10^{-9}$ , meaning pyridate is less volatile than water. A fish study indicated that pyridate bioaccumulates (464 times), but 99% of residues were eliminated in 14 days.

In summary, the data indicate that in terrestrial and aquatic environments, pyridate rapidly hydrolyzes to CL-9673 with half lives usually  $\leq 3$  days. Although pyridate is also rapidly hydrolyzed under anaerobic soil conditions to CL-9673, CL-9673 is persistent and undergoes very little degradation with half lives from 330-630 days in anaerobic soil conditions. Aerobic half lives of CL-9673 are about 10-30 weeks in soils (incorrectly given as 10-30 days in the EPA one-liner database). CL-9673 is rapidly degraded under the influence of light as indicated by the 14 day half life in the water and 16 day half life in soil. In general, pyridate and its primary degradate, CL-9673, will not persist in aerobic conditions, while CL-9673 will persist in anaerobic conditions.

### **IV. Water Resources Summary**

#### **A. Surface Water (Modeling and Monitoring)**

The GENEEC model was used to estimate surface water concentrations for pyridate (See Attached Memo: Pyridate Environmental Fate Characteristics and Estimated Ground

Water and Surface Water Concentrations Resulting from Proposed Use on Garbanzo Beans: Chemical No. 128834, DP Barcode D223398, Case 287340, ID 6E04667). The modeling results show that pyridate has the potential to move into surface waters, especially during times of unusually heavy rainfall.

The peak GENEEC estimated environmental concentration (EEC) of pyridate in surface water is 97 ppb (Table 1). This estimate is based on a maximum application rate of 0.9 lb. ai/acre. The GENEEC values represent upper-bound estimates of the concentrations that might be found in surface water due to pyridate use.

Available data show that pyridate and its primary degradate degrade rapidly by hydrolyses and photolysis and would not be expected to create a surface water contamination problem. However, if runoff were rapid, taking less time than the aqueous photolysis half life of up to 14 days, such as following a heavy rain, and CL-9673 was discharged to surface water with anaerobic conditions, it then could persist for a significant length of time of 1.5 to 2.5 years. (An anaerobic aquatic half life is not known, but can be estimated from the anaerobic soil metabolism value to be 1.5 to 2.5 years).

GENEEC (US EPA, 1995) is a screening model designed by the Environmental Fate and Effects Division (EFED) to estimate the concentrations found in surface water for use in ecological risk assessment. As such, it provides upper-bound values on the concentrations that might be found in ecologically sensitive environments because of the use of a pesticide. It was designed to be simple to use and to only require data that is typically available early in the pesticide registration process. GENEEC is a single event model (one runoff event), but can account for spray drift from multiple applications. GENEEC is hardwired to represent a 10-hectare field immediately adjacent to a 1-hectare pond that is 2 meters deep with no outlet. The pond receives a spray drift event from each application plus one runoff event. The runoff event moves a maximum of 10% of the applied pesticide into the pond. This amount can be reduced due to degradation on the field and the effects of soil binding in the field. Spray drift is equal to 1 and 5% of the applied rate for ground and aerial spray application, respectively.

### 1) Aquatic Ecosystems

Table 1. Tier I upper tenth percentile EEC's for pyridate.

Compound	Peak GEEC	4 Day GEEC	21 Day GEEC	56 Day GEEC
Garbanzo beans	97 ppb	95 ppb	88 ppb	75 ppb

Input values used in the surface water model are given in Table 2.

Table 2. Surface Water Exposure Inputs for GENEEC for Pyridate.

DATA	VALUE
Application rate	0.9 lb ai/A (label)
Maximum number of application per year	2 (label)
Interval between applications	20 days (label)
Soil organic carbon coefficient (Koc)	3 (lowest computed for three soils) <sup>1</sup>
Soil aerobic metabolism (maximum value)	210 days (261827)
Solubility	1.5 ppm (one liner database)
Aerobic aquatic metabolism half life	75 days(one liner, supplemental study)
Photolysis half life	14.1 days(40939103)

## 2) Drinking Water

EFED recommends that the same concentrations derived for the surface water be used for the drinking water assessment (See attached memo: Pyridate Environmental Fate Characteristics and Estimated Ground Water and Surface Water Concentrations Resulting from Proposed Use on Garbanzo Beans: Chemical No. 128834, DP Barcode D223398, Case 287340, ID 6E04667). EFED recommends a peak EEC of 97 ug/L for the acute human health risk assessment from surface water source drinking water. The EEC that should be used for the chronic and cancer human health risk assessments from surface water source drinking water is the 56 day mean value of 75 ug/L. The EEC is based on the use rate of 0.9 lbs/acre. It is EFED's understanding that 0.9 lbs/acre is the highest registered use rate.

## 3) Monitoring

No monitoring data is available at this time.

## B. Ground Water

Table 3 shows the input parameter values used in SCI-GROW for pyridate and the resulting estimated ground water concentration.

EFED estimates a ground water drinking water exposure concentration of 4.44 ppb for pyridate as predicted by SCI-GROW modeling results (See attached memo: Pyridate Environmental Fate Characteristics and Estimated Ground Water and Surface Water Concentrations Resulting from Proposed Use on Garbanzo Beans: Chemical No. 128834, DP Barcode D223398, Case 287340, ID 6E04667). There may be exceptional circumstances under which groundwater concentrations

could exceed the SCI-GROW estimates. However, such exceptions should be quite rare since the SCI-GROW model is based exclusively on maximum groundwater concentrations from studies conducted at sites and under conditions which are most likely to result in groundwater contamination. The groundwater concentrations generated by SCI-GROW are based on the largest 90-day average recorded during the sampling period. The concentration (4.44 ppb) can be considered as both the acute and chronic values.

Table 3. SCI-GROW Environmental Fate Input Parameters for Pyridate

Average $K_{oc}$ (l/kg) <sup>1</sup>	64.5
Application rate (lb a.i./acre)	0.9
Number of applications per year	2
Use rate (maximum total/season)	1.8 lb ai/A
Aerobic soil metabolism half-life (days)(average)	105
Relative intrinsic leaching potential	4.9
Estimated groundwater concentration	4.44 ppb

### C. Recommendations for Drinking Water Concentrations

EFED recommends a peak EEC of 97 ug/L for the acute human health risk assessment from surface water source drinking water. The EEC that should be used for the chronic and cancer human health risk assessments from surface water source drinking water is the 56 day mean value of 75 ug/L. The EEC is based on the use rate of 0.09 lbs/acre. It is EFED's understanding that 0.09 lbs/acre is the highest registered use rate.

## V. Ecological Risk Assessment

### A. Terrestrial Animals

Risk quotients indicate that the level of concern (LOC) for acute risk for the proposed use is not exceeded for terrestrial animals (Table 3). Risk quotients also indicate that the LOC for chronic risk is not exceeded for birds, but the LOC for chronic risk is exceeded for mammals.

Table 3. Toxicity and Risk Quotients for Terrestrial Wildlife [and Beneficial Insects].

Animal Group	Exposure Type	Most Sensitive Species	Toxicity	EEC (ppm)	Risk Quotient
Birds	Acute	Northern bobwhite and Mallard	LC <sub>50</sub> = 1505 ppm <sup>a</sup>	432 <sup>b</sup>	< 0.1 <sup>c</sup>

Animal Group	Exposure Type	Most Sensitive Species	Toxicity	EEC (ppm)	Risk Quotient
Birds	Chronic	Northern bobwhite and Mallard	NOAEL= 640 ppm <sup>a</sup>	432	< 1 <sup>c</sup>
Mammals	Acute	Rat / Mouse	LD <sub>50</sub> =3544 mg/kg <sup>a</sup>	432	< 0.1 <sup>c</sup>
Mammals	Chronic	Rat / Mouse	NOAEL= 216 ppm <sup>a</sup>	432	2 <sup>d</sup>
Insects	Acute	Honeybee	No Record	NA	NA

<sup>a</sup> Sec 18 DP Barcode D244668

<sup>b</sup> The exposure for terrestrial animals is usually determined by the Kenaga/Fletcher nomogram. The highest terrestrial residue anticipated is determined by multiplying the residues found on short grass (240 ppm) after application of 1 lb ai/A with the application rate (0.9 x 2 applications) resulting in 432 ppm.

<sup>c</sup> The risk quotient does not exceed the level of concern.

<sup>d</sup> The risk quotient exceeds the level of concern.

## B. Aquatic Animals

The LOC has been exceeded for endangered species of freshwater, marine, and estuarine fish. After consulting with OPP's Endangered Species Protection Program, it was agreed that the endangered fish species will not be affected by the labeled use of pyridate because of the very low LOC exceedances for endangered fish species and the streams and rivers where these species are found are rapid and large. The exposure of these fish species to pyridate is not expected to warrant any concern.

Although the LOC for endangered freshwater and estuarine invertebrates were exceeded, there are no endangered species of these invertebrates listed in the state of Montana. Therefore, there is no concern in Montana for endangered freshwater, marine, or estuarine invertebrates.

The LOC has also been exceeded for consideration as a restricted use candidate for estuarine fish and clams/mussels (See Table 4). Although the LOC has been exceeded for restricted use, the LOC exceedances are uncertain for the following reasons:

- ◆ The GENEEC-run concentrations may be more reflective of the pyridate degradate, CL-9673, since the parent pyridate tends to degrade to CL-9673 rapidly. Toxicity data for CL-9673 are not available for freshwater fish and estuarine species (See Attached memo: Section 18 Emergency Exemption - Use of Pyridate on Garbanzo Beans (Chickpeas) in Idaho to Control Broadleaf Weeds (D244991, PC Code# 128834, ID # 98ID0019).
- ◆ The aquatic toxicity tests were conducted under static conditions. The static conditions may have initial toxicity of the parent pyridate and later have toxicity of the degradate, CL-9673. It is uncertain what chemical the organisms may have been exposed to for

the duration of the time. CL-9673 toxicity data on *Daphnia* show that CL-9673 may be less toxic than the parent pyridate on aquatic organisms however, this is uncertain due to lack of toxicity data on CL-9673.

- ◆ Pyridate is insoluble in water at approximately 1.5 ppm. The  $LC_{50}$  for rainbow trout is greater than the highest concentration tested. About 40% of the fish were dead at the highest concentration. The bluegill study showed no mortality at the highest concentration tested (2.1 ppm). Since the LOC for freshwater fish is very marginal, it is the opinion of the reviewer that minimal risk can be expected.
- ◆ Pyridate is insoluble in water at approximately 1.5 ppm. The  $LC_{50}$  for estuarine fish is greater than the highest concentration tested. There are no mortalities found at the highest concentration tested in estuarine fish study. This lack of mortality may show that the LOC exceedances may be much lower than estimated.

There are no chronic data available to provide chronic risk assessment for aquatic species.

Table 4. Toxicity and Risk Quotients for Aquatic Animals.

Animal Group	Exposure Type	Most Sensitive Species	Toxicity	EEC (ppb)	Risk Quotient
Freshwater Fish	Acute	Freshwater fish	$LC_{50} = > 1200$ ppb <sup>a</sup>	97 <sup>b</sup>	0.08 <sup>c</sup>
	Chronic	Fathead minnow	No Record		
Freshwater Invertebrates	Acute	<i>Daphnia magna</i>	$LC_{50} = 1080$ ppb <sup>a</sup>	97	0.09 <sup>c</sup>
	Chronic	<i>Daphnia magna</i>	No Record		
Estuarine/ Marine Fish	Acute	Sheepshead minnow/ Silverside	$LC_{50} 300$ ppb <sup>a</sup>	97	0.32 <sup>c</sup>
	Chronic	Sheepshead minnow	No Record		
Estuarine/ Marine Invertebrates	Acute	Eastern oyster	$LC_{50} = 145$ ppb <sup>a</sup>	97	0.66 <sup>c</sup>
	Chronic	Mysid	No Record		

<sup>a</sup> Sec 18 DP Barcode D244668

<sup>b</sup> Derived by GENEEC Model.

<sup>c</sup> The level of concern has been exceeded.

### C. Terrestrial and Aquatic Plants

Since there are no plant toxicity data available, no plant risk assessment can be done. Therefore EFED assumes that terrestrial and aquatic non-target plants (including endangered species) will be adversely affected from the labeled use of pyridate.



## VI. Effects on Endangered Species

The following endangered fish species may inhabit counties where pyridate is to be used on:

Bull trout  
Pallid Sturgeon

Although the level of concern (LOC) has been exceeded for the above endangered species. After consulting with OPP's Endangered Species Protection Program, it was agreed that the endangered fish species will not be affected by the labeled use of pyridate because of the very low LOC exceedances for endangered fish species and the streams and rivers where these species are found are rapid and large.

Although the LOCs are exceeded for freshwater, estuarine, marine invertebrates, there are no endangered species of these invertebrates listed in the state of Montana. Therefore, there is no concern for Montana for endangered freshwater, marine, or estuarine invertebrates.

The following endangered species of mammals inhabit the areas for the proposed use of pyridate:

<u>County</u>	<u>Species</u>
Lane	Columbian White-Tailed Deer

Because of the low exceedance of the level of concern in proportion with body weight of the endangered species, EFED believes that there are minimal risk to this species in Oregon for the proposed use.

Since, there are no plant toxicity data available, no plant risk assessment can be done. Therefore, a default assumption is that terrestrial and aquatic non-target plants (including endangered species) will be adversely affected from the labeled use of pyridate.

There is a concern for the endangered plant species, Water Howellia, in Lake county. Measures must be taken to ensure the protection of this species from pyridate exposure by contacting Montana state endangered species program and/or the U.S. Fish and Wildlife Service.

## VII. Recommended Label Modifications

No additional labeling modifications are recommended.

